



KALASALINGAM
ACADEMY OF RESEARCH AND EDUCATION
(DEEMED TO BE UNIVERSITY)

Under sec. 3 of UGC Act 1956. Accredited by NAAC with "A++" Grade



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KALASALINGAM TEACHING LEARNING CENTRE **(KAL – Tec)**



Annual Report

Academic Year 2023 - 2024

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Executive Summary

During 2023-24, Kalasalingam Teaching Learning Centre (KAL-Tec) at KARE continued to enhance teaching and learning practices through innovative programs and faculty development initiatives. Our collaboration with the IUCEE led to new milestones, including workshops and leadership programs. Our faculty and students are actively engaged with all the IUCEE initiatives. We also allocate credits to students for successfully completing IUCEE - NEP courses. A total of 50 faculty members are practicing in problem / project-based learning (P2BL) supported by Vishwaniketan Institute, Maharashtra. New and innovative approaches were designed and adopted for the effectiveness of OBE, giving complete autonomy to faculty in teaching and evaluation. IUCEE TLC Award was awarded to the TLC leader and 3 more faculty members during ICTIEE 2024. We have also strengthened our community service initiatives in collaboration with our industry and NGO partners. Our PDSA model to address the faculty training programme requirements supported by counterpart student training is a unique approach which has helped in achieving our intended goals.

Mission and Vision Statement

KalTec's aim is to provide the best teaching and learning experience that is memorable for all students and faculty and further encourages life-long learning.

Vision: To promote effective participation of faculty members and students in the teaching-learning-evaluation process.

Mission: To train faculty members in innovative pedagogy and bring innovation in evaluation methods to meet spirit of OBE.

Introduction

Message from the Director

In the AY 2023-24, the Centre for Teaching Learning at KARE (KAL Tec) made significant strides in enhancing teaching and learning practices. Key achievements include organizing over 12 Faculty Development Programs (FDPs) across disciplines, with workshops on digital tools like Block Chain and active learning strategies. The KalTec successfully introduced flexible internal assessments to promote Outcome-Based Education (OBE), engaging 50 faculty members in Problem-Based Learning (P2BL) initiatives. The centre also strengthened its collaboration with the Indo Universal Consortium for Engineering Education (IUCEE), participating in global webinars and research projects focused on innovative teaching learning methodologies for both faculty and students. The Kal Tec faced the dual challenges of adapting to the evolving needs of higher education and maintaining academic excellence. The center implemented several programs aimed at enhancing faculty competency in teaching methodologies and the digitalization of education, all while fostering a culture of continuous improvement. The introduction of active learning pedagogy, alongside traditional methods, helped us push forward into a new era of education at KARE.

Dr. C. Sivapragasam, Director

Highlights of the Year

1. A major initiative was taken to design and implement service learning (Experiential and Service Learning - ExSEL) for the UG students promoting inter-disciplinary concepts to be applied to solve community related problems. Some of these projects were mentored by Purdue University and some carried out in association with Amar Seva and Dhan Foundations. The outputs from these projects reached stakeholders in wide range of community.
2. A major initiative was taken to promote Project and Problem Based Learning (P2BL). Initially about 30 faculty members were given a training on P2BL concept, out of which 7 faculty members were selected for intense one year real time training cum implementation in association with KL Tech University and Aalborg University. With these 7 faculty members as the main facilitators, about 50 faculty members across the campus are being trained in P2BL implementation in association with Viswaniketan University. We are aiming to be a centre of excellence in P2BL concept.
3. The second major initiative was to strongly promote the spirit of OBE. Although faculty members know the technicality of OBE and use of software to calculate OBE attainment as required for NBA purpose, the spirit of OBE is not understood clearly by most. With the help of Dr. Umakant Kulkarni (who has been a resource person for many IUCEE events on OBE), a 3 days workshop was conducted, following which the KARE TLC has conducted subsequent department level workshops spread throughout the academic year.
4. The third major initiative was to strongly promote entrepreneurship in the UG curriculum. We have designed a credit course with inputs from IUCEE webinars and online courses as well as from the benchmark institutions. Further, TLC played a crucial role to train 41 faculty members and help approx. 500 students with support from Wadhwani Foundation, India.

All these efforts have significantly contributed to fetch various awards for the University such as A++ rating in NAAC, 36th rank in Engineering University Category by NIRF, 148th rank in South Asia by QS Asia Rankings, within 800 rank in various THE World Rankings. Besides, 4 of our faculty were awarded Teaching Learning Award during 11th ICTIEE by IUCEE. Our Entrepreneur Cell was given Certificate of Recognition for Excellence in Entrepreneurial Motivation at Elets World Education Summit.

Success Stories relevant to the mission of IUCEE:

1. KARE has strongly implemented the spirit of OBE. Our faculty members have full flexibility in designing syllabus, course delivery and evaluation (see evaluation scheme change sample). Most of the courses have a course level project component associated. We also implemented evaluation of students by industry personnel and transfer of credits from online courses, including that offered by IUCEE. KARE has a strong experience on P2BL implementation.

S. No	As per regulation 2021		Proposed change in Assessment	
1.	Sessional Exam I	17.5 %	Quiz	7.5 %
2.			Open book test	10%
3.	Sessional Exam II	17.5 %	Sessional Exam II	7.5 %

4.			Industry personnel evaluation	10%
5.	Mid Semester Practical	10%	Mini project	10%
6.	Regular Laboratory Performance	5%	Experiment based evaluation	5%
	Total	50%	Total	50%

2. KARE obtained a funding worth 75 Lakhs from various Central/State Govt funding agencies in developing innovative products by our UG students as an outcome of promoting entrepreneurship initiative such as Non-invasive skin cancer diagnosis kit, Wearable therapeutic belt, Graphene batteries etc.
3. A collaboration between EPICS program led by Purdue University, USA and andExSEL led by KARE brought a joint model to improve teaching for visually impaired students at the Indiana School for the Blind and Visually Impaired (ISBVI), Indianapolis, USA by addressing educational barriers.

Programs and Services

Some of the special programs and services offered by TLC are as discussed below with testimonials from participants, as relevant:

1. Semester Long Training Programme on Active Learning Pedagogy: A total of 30 faculty are trained in various active learning pedagogy such as Role Play Fish Bowl, Mud Card, Experiential Learning etc. [*Testimonial: I implemented active learning techniques for the course Control Systems Engineering. By involving students actively in problem-solving, simulations, for real-world applications, the course was quite beneficial and more engaging during the assessment – Dr. Josephine, Assoc. Prof. /ECE*]
2. Semester Long Training on Python Programming: TLC coordinated the training by Prof. Sohum Sohoni of MSOE and subsequent implementation of this training for 15 faculty members which concluded with a faculty conclave. [*Testimonial: I got a deep insight into how to utilize activity-based learning particularly muddiest point and affinity clustering. The student's interest in learning and performance was beyond my expectations. I thank Prof. Sohum for spending his time to go through our assignments and lecture notes and insightful comments - Dr. K.S. Kannan, Assoc. Prof. /CSE*]
3. Training the Trainers Program - an IBM Collaboration: TLC has been an instrumental partner in driving IBM's mission to equip students with industry-relevant skills. TLC has organized and subsequently reviewed the effective implementation. A total of 30 faculty members were trained who help in creating dynamic learning environments where students engage directly with real-world challenges, from hackathons and codeathons to model development sessions [*Testimonial: The IBM course provided a solid foundation in current technologies. The IBM application-based project was particularly beneficial, as it offered a range of stream-specific problem statements, making it easy to choose and work on relevant projects - Mr. Bharath, B.Tech (IV year) - CSE*]
4. Lab courses towards research aptitude: TLC conducted training session for faculty members of core engineering branches (Civil, Mechanical, EEE, Chemical etc) to help students develop research aptitude. A total of 25 faculty members were trained. [*Testimonial: I have got clarity on how the design of experimental objectives, conduction of experiments and inference of results from a conventional laboratory courses with conventional experiments can be taught to students to develop their research potentials. I*

learnt that many newer experimental objectives can be formulated from one single experiment set-up which inculcates research aptitude. My students are able to publish papers even from conventional experiments in laboratory - Dr. S. Vanitha, Assoc Prof/Civil]

Under the section on "Research and Innovation" below, an extension of this for students is given with the testimonial.

Professional Development Initiatives

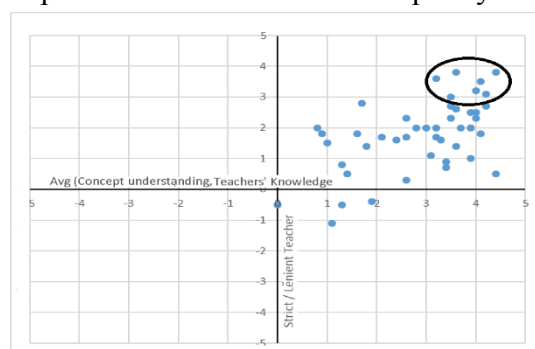
For the year 2023-2024, the KalTec conducted several professional development programs, including sessions on digital tools like Block Chain and Video Production platforms. The highlights include:

S.No	School / Dept	FDP	Date
1.	ECE	Microcontroller Interfacing and IoT sensor Device	1 st – 3 rd June 2023
2.	Viscom	Advanced Photo and Video Production	8 th – 9 th June 2023
3.	IT	Data Science and Visualization using Python	3 rd - 4 th July 2023
4.	SBCE	Application of Computational Techniques for Process Engineering	1 st – 3 rd June 2023
5.	SAME	Robotics and Simulation using Python and C Programming Languages	14 th – 15 th June 2023
6.	CSE	Block Chain Technologies and Applications	12 th – 14 th June 2023
7.	CS&HM	Post COVID changes in Hospitality	3 rd June 2023
8.	KBS	Data Analysis using PLS and Nvivo	3 rd – 4 th July 2023
9.	SAS (Physics)	Active fostering of Physics Toolbox	20 th Feb 2024
10.	All departments	i) Modified Micro Teaching Pedagogy (mMTP) & Comparisons Thereof	23 rd Feb 2024
11.	All departments	Synesthetic Learning Pedagogy (SLP)	1 st March 2024
12.	Agricultural	A seminar on Smart Agriculture – Robotics, IoTs, Drones & AI	8 th March 2024

Research and Innovation

TLC has contributed in the following innovation through appropriate pilot research study, which was received well by our stakeholders including the NAAC committee:

1. **Quadrant analysis-based student feedback analysis system:** The TLC devised a unique quadrant method to investigate cross parameters effect in the quality of teaching-learning. For instance, if it is desired to study how the students perceive a faculty member's knowledge of the subject Vs his/her being strict or lenient, the same can be plotted as a quadrant graph as shown below. A data falling in quadrant II indicates that the faculty's knowledge of the subject as



perceived by the students is not upto the mark but he is being strict. The teacher can expect a lot of dissatisfaction from the class unless addressed *[Testimonial: I am very much impressed with this innovative feedback analysis and other initiatives by KARE which shows their keen interest in the quality of education being imparted - Chairman, NAAC committee]*.

2. **OBE from students' perspective:** This is a unique initiative. Although lot of emphasis has been given on training faculty on OBE spirit, we also found the need for training students as well for the overall effective implementation of OBE. Usually, students are completely unaware of the principles of OBE. TLC devised a metrics for the students to do a self-assessment on 12 POs. Based on the student performance, methods are devised to help them take initiative on their own for PO attainment. This has improved the student's involvement in the T-L process. This has been implemented for Civil and ECE departments in the first phase. *[Testimonial: This project-based course in my first year had a clear outcome of creating an innovative product using engineering visualization, with specific guidance on aspects like design, planning, and execution. Overall, this experience gave me the feeling of an Outcome Based Education – Ms. Selva Jothheha, III year, ECE]*.
3. **Research aptitude development using curriculum lab from students' perspective:** As a counterpart of the initiative taken for the faculty members, TLC also took initiative for students to get enriched in the same concept. The students came up with very innovative research objectives from the conventional experimental set up. *[Testimonial: Participating in the session was a truly enlightening experience. I was glad to find out about the efforts put in by our professors to mould the curriculum lab to foster research aptitude. The session provided a fresh outlook on using lab spaces not only for technical skill-building but also as environments to cultivate curiosity and critical thinking. It gave me clarity on my personal goals and how to work towards them. The examples discussed highlighted effective ways to promote student-centered learning, aligning closely with IUCEE's mission. Initiatives like this are essential in advancing IUCEE's vision of transformative education. - Ms. Meenakshi, B.Tech (IV Year) - Biotech]*

Community Engagement and Outreach:

The TLC engaged in the following noteworthy community engagement/outreach:

1. Through our contribution in the conducting the course on ExSEL, the indigenously developed products and technology by our faculty and students have been transferred to the community including the industry and NGO who coordinated in such technology transfer.
2. In a joint venture with Mahalingam College of Engineering and Technology, Pollachi, the TLC has worked on a vital topic "The Use of ICT at Student Induction Level towards Bringing Equity and Inclusion in HEIs in India" and has been published in the Scopus indexed IGI publication as a book chapter and is in wide circulation among many stakeholders across the world.
3. Two of our TLC team members acted as resource persons for a one-day workshop cum seminar on "Harnessing Power of Technology for effecting Teaching and Learning" at Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya (Deemed-to-be- University) at Kanchipuram.

4. Our TLC Director has been selected as the IQAC member representing Academia for the DC School of Architecture and Design, Kerala with a clearly identified role to improve the quality of teaching and learning in the institute.

Challenges and Lessons Learnt

There are two major challenges we faced as detailed below along with the solution approach:

1. Ours being a large university with 500+ faculty members and 10,000+ students, implementing quality initiatives for all the stakeholders is a big challenge. We adopt the Plan-Do-Study-Act (PDSA) model, wherein all our new initiatives we start first as a pilot study. We implement it in one or two departments, study the pros and consequence of that. Then with the trained faculty, we disseminate the training to others. Although it appears to be time taking process, the errors are minimum.
2. We regularly conduct many training programmes for faculty members, which many a times faculty find it difficult to effectively implement because the students are not in tune with the same. We realized that it is necessary to offer a counterpart training programmes for students as well to uplift their reference level to receive better from the faculty. We had a better success in implementing OBE and conduction of lab courses for core engineering program by designing a counterpart training programmes for students.

Financial Overview

TLC operates on a budget sourced from university funding. Expenditures primarily covered faculty training, technology integration, and community engagement programs. A breakdown of expenditures is given below:

Activity	Budget (Rs)
IUCEE Membership	1,29,600/-
FDPs	2,06,000/-
Python programming by Prof Sohum/MSOE + Train the Trainers (IBM)	4,00,000/-
P2BL	3,60,000/-
Participation in IUCEE events including Leadership summit, online courses, ICTIEE, IASF etc	2,00,000/-

Future Goals

1. To become Centre of excellence in P2BL implementation
2. Strengthen AI and machine learning into teaching methodologies
3. Design and conduct counterpart student training programs for the major quality initiatives towards faculty training
4. Expand community engagement and outreach

Acknowledgement

We extend our heartfelt thanks to our Management for their ever eagerness to support all the quality initiatives of the Kal Tec. We thank our faculty members, students and staffs for their participation and contribution in the various training programmes. A special thanks to IUCEE for its various continued initiatives towards improving the quality of teaching learning.

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